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**AN UNUSUAL NEW SPECIES OF ACERATONEUROMYIA GIRAULT  
(HYMENOPTERA, EULOPHIDAE), WITH REDESCRIPTION OF  
A. ATHERIGONAE FERRIÈRE**

By EIJI IKEDA <sup>1)</sup>

*Abstract*

IKEDA, E. 1999. An unusual new species of *Aceratoneuromyia* Girault (Hymenoptera, Eulophidae), with redescription of *A. atherigonae* Ferrière. *Ins. matsum. n. s.* 55: 1–11, 28 figs.

*Aceratoneuromyia kamijoi* sp. n. is described from Japan and Korea. *A. atherigonae* Ferrière is redescribed on the basis of the type material and additional specimens from Japan and Thailand.

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*Contents.* Introduction — *Aceratoneuromyia atherigonae* — *A. kamijoi* sp. n. — References.

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## INTRODUCTION

The genus *Aceratoneuromyia* Girault, subfamily Tetrastichinae, has been represented by 7 species occurring in the Old World up to the present (Graham, 1987). Two of these species are also distributed in the New World (LaSalle, 1994).

Members of this genus are gregarious endoparasites of dipterous larvae and pupae, mainly of Tephritidae, Calliphoridae, Muscidae, and Sarcophagidae (LaSalle, 1994). A South Asian species, *A. indica* (Silvestri), has been introduced into Italy, Australia, South Africa, Central and South America for biological control of various fruitflies (Bouček, 1988; Graham, 1991; LaSalle, 1994).

*Aceratoneuromyia atherigona* Ferrière, 1960, is the only species of this genus which has been recognized from Japan. Graham (1991) examined a pair of non-type material of this species, and provided a key to the Old World species, but did not give a detailed redescription for this species. In this paper, I redescribe *A. atherigona* Ferrière on the basis of the type material and additional specimens, and describe an unusual new species from Japan and Korea. This new species disagrees in some characters with the diagnoses of *Aceratoneuromyia* given by previous authors; therefore, I propose some modifications for the concept of this genus.

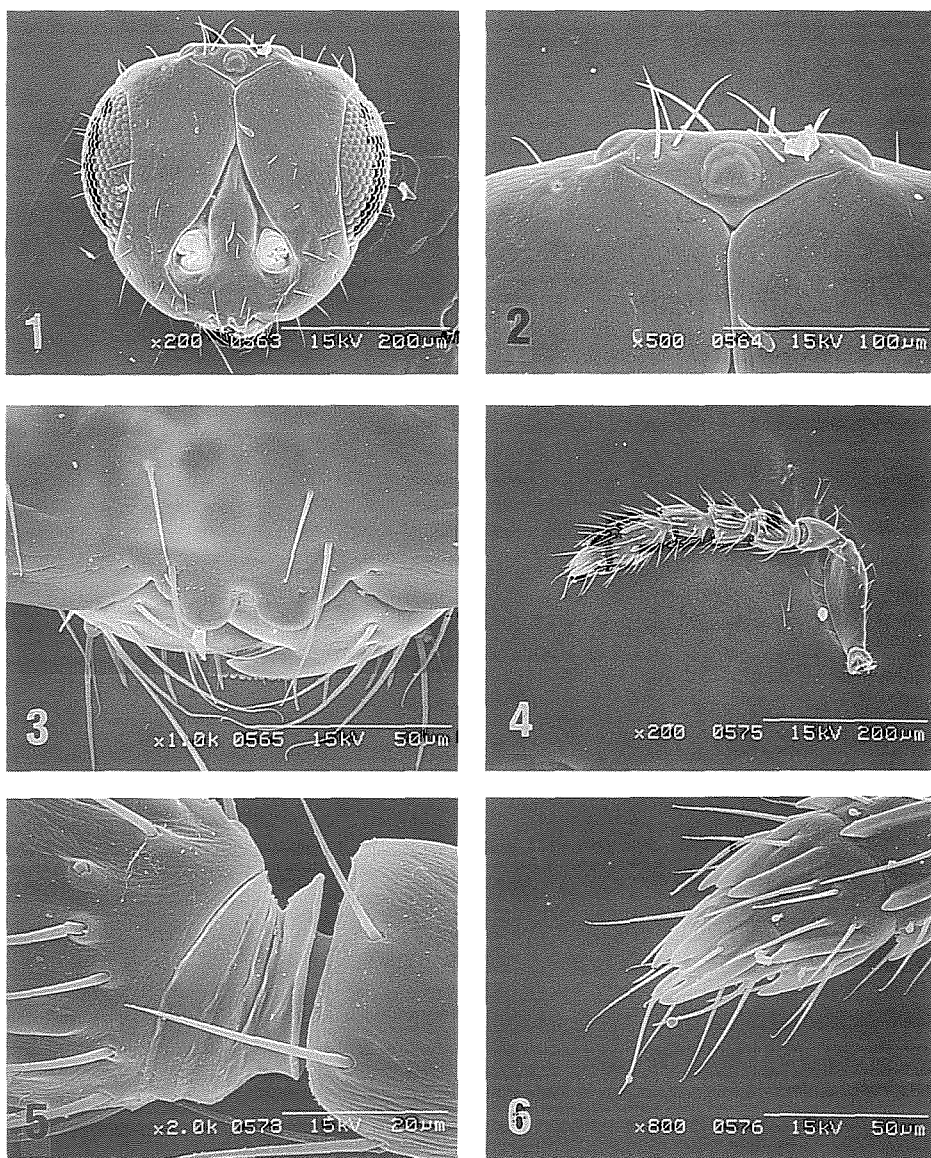
The holotype of *A. kamijoi* sp. n. is deposited in the collection of the Laboratory of Systematic Entomology, Faculty of Agriculture, Hokkaidô University (SEHU). The paratypes are deposited in SEHU, Entomological Laboratory of Kyûshû University, Fukuoka, Japan (ELKU); the National Institute of Agro-Environmental Sciences, Tsukuba, Japan (NIAES), Entomological Laboratory of Meijo University, Nagoya, Japan (ELMU), Canadian National Collection of Insects, Ottawa, Canada (CNCI), and The Natural History Museum, London, UK (BMNH).

I deeply thank I. Löbl (Muséum d'Histoire Naturelle, Genève, Switzerland) for the loan of the type material of *A. atherigona*. I also thank K. Konishi (NIAES), K. Morimoto and S. Kamitani (ELKU), K. Yamagishi (ELMU), J. LaSalle (BMNH), J. T. Huber (CNCI), Y. Sakamaki (SEHU), M. Ôhara (Otaru Museum, Japan), and T. Yabuki (Kutchan, Japan) for the loan or gift of specimens, and T. Ito (Electron Microscope Laboratory, Hokkaidô University) for his assistance in taking SEM pictures. I am thankful to K. Kamijo (Bibai, Japan), S. Takagi, and M. Suwa (SEHU) for their critical reading of the manuscript. This study was partly supported by Research Fellowships of the Japan Society for the Promotion of Science for Young Scientists.

### *Aceratoneuromyia atherigona* Ferrière (Figs. 1–14)

*Aceratoneuromyia atherigona* Ferrière, 1960: 106–108. — Domenichini, 1966: 55. — Graham, 1991: 41.

Ferrière (1960) described this species from 20 females and 3 males, and stated that he deposited the type in the Muséum d'Histoire Naturelle, Genève, and paratypes in the Kyûshû University. Graham (1991: 41), however, states that the sex of the "Type" was not stated (probably ♀) and it will be necessary to validate it by a more precise designation. I examined 5 females of the type-series all of which are deposited in the Muséum d'Histoire Naturelle,



Figs. 1–6. *Aceratoneuromyia atherigona* Ferrière, ♀. — 1. Head; 2. Vertex; 3. Mouth; 4. Antenna; 5. Anelli; 6. Apex of clava.

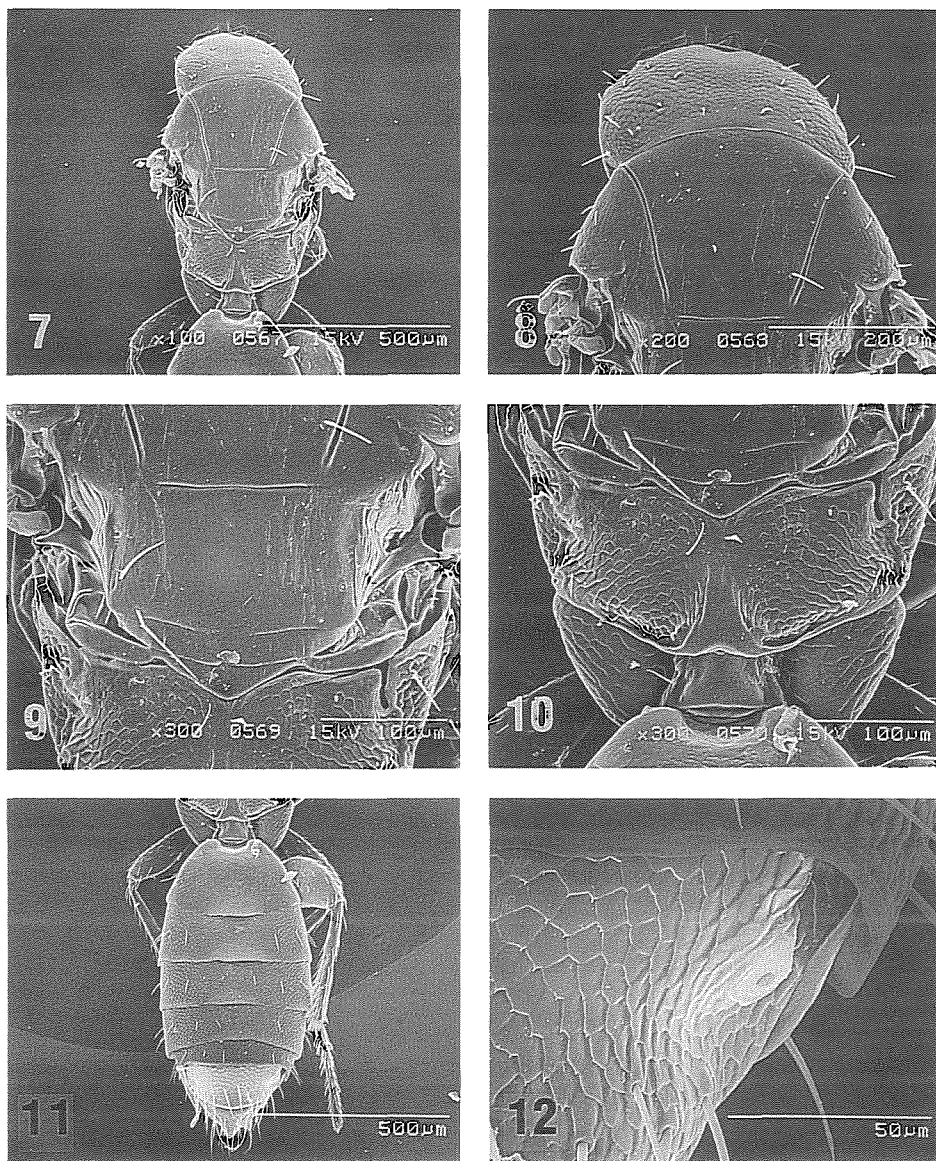
Genève, and preserved in good condition. One female is labelled: "Typus"; "Honshû, gifu, IX. 1953, T. Muto"; "Japan"; "Ex *Atherigona* sp. de tige de millet"; "*Aceratoneuromyia atherigona*, Type, Ch. Ferrière". The other specimens are labelled: "Japan, Honshû I., IX. 1953, T. Muto", Ex *Atherigona* sp. de tige de millet", and "*Aceratoneuromyia atherigona*. Ch. Ferrière, Co type". I here designate the first one as lectotype, and the others as paralectotypes.

### Diagnosis

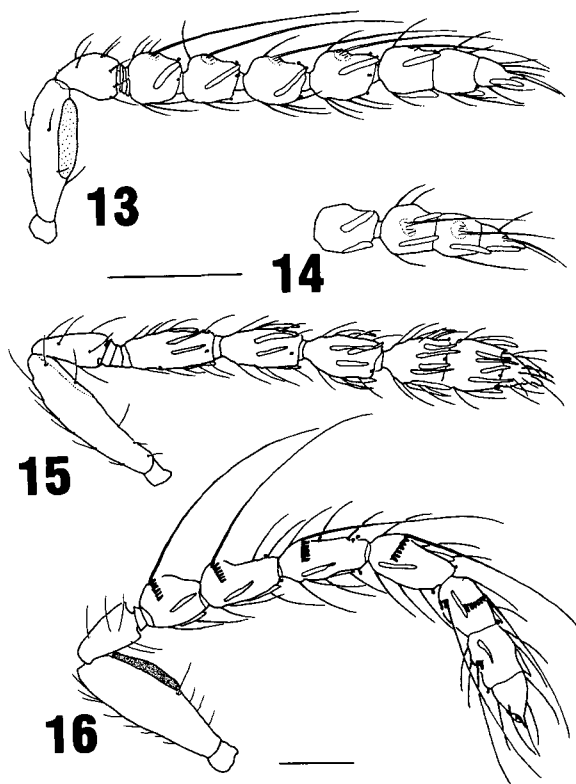
Submedian line of scutellum present but weak (Fig. 9). Scape 0.6–0.8 times as long as eye height, not reaching vertex. Costal cell 13–14 times as long as wide. Propodeum (Fig. 10) 1.6–3.3 times as long as dorsellum.

### Redescription

Female. Body 1.2–1.7 mm. Body dark brown to black. Antenna dark brown: scape



Figs. 7–12. *Aceratoneuromyia atherigoniae* Ferrière, ♀. — 7. Thorax; 8. Pronotum and mesoscutum; 9. Scutellum; 10. Dorsellum and propodeum; 11. Gaster; 12. Spiracle of gaster in dorsal view.



Figs. 13–16. — 13. *Aceratoneuromyia atherigonae* Ferrière, ♂, inner view of antenna. The scape is drawn in the anterolateral view; 14. Ditto, ♂, outer view of F4 and clava; 15. *A. kamijoi* sp. n., ♀, antenna in inner view; 16. Ditto, ♂, antenna in outer view. Scale: 0.1 mm.

pale to dark brown. Coxae and femora dark brown; tibiae pale brown, rarely dark brown; tarsi pale brown; tips of tarsi infusate. Wings hyaline.

Head (Fig. 1) 1.1–1.3 times as wide as high, 2.5–3.0 times as wide as long, 1.0–1.2 times as wide as thorax, very weakly engraved-reticulate, almost smooth. Vertex (Fig. 2) with relatively long setae, without groove between lateral ocellus and eye. POL about 3.0, OOL about 2.5 times as long as median ocellus diameter. Frontofacial sutures distinct. Eye 1.5–1.7 times as high as malar space length. Scrobal groove deep. Tentorial pit very small, indistinct. Malar sulcus distinct. Mouth (Fig. 3) about 1.1–1.3 times as long as malar space. Antenna (Figs. 4, 5, 6): scape 2.0–3.0 times as long as wide, 0.6–0.8 times as long as eye height, not reaching median ocellus; combined length of pedicel and flagellum 0.8–0.9 times as long as head width; pedicel 0.5–0.6 times as long as scape; F1 varying from slightly longer than wide to slightly wider than long, 0.6–0.8 times as long as pedicel; F2 about as long as wide, varying from slightly longer to slightly shorter than F1; F3 about as long as wide, about as long as F2; clava (Fig. 6) 1.7–2.4 times as long as wide, 2.4–2.8 times as long as F3.

Thorax (Fig. 7) 1.6–1.8 times as long as wide. Pronotum (Fig. 8) relatively long, 0.3–0.5 times as long as mesoscutum, distinctly engraved-reticulate. Mesoscutum 1.2–1.6 times as long as scutellum, very weakly engraved-reticulate, almost smooth, with 2, rarely 3,

pairs of adnotaular setae, without median line; one pair of very small but distinct pits present posteriorly. Axilla strongly advanced, and fused with side lobe of mesoscutum. Scutellum (Fig. 9) 0.6–0.8 times as long as wide, almost smooth; submedian line weak, much closer to sublateral line than to each other; sublateral line distinct but shallow; scutellar setae shorter than width of median area of scutellum between submedian lines; anterior pair of setae situated behind the middle of scutellum, and along sublateral line, directed anteriorly; posterior pair situated in the middle between submedian and sublateral lines, and along frenal line; frenal line indistinct in the middle. Dorsellum very weakly engraved-reticulate or smooth. Propodeum (Fig. 10) 1.6–3.3 times as long as dorsellum, 0.4–0.8 times as long as scutellum, distinctly engraved-reticulate, with low and wide median carina which is sometimes posteriorly widened; anterior part of median carina sometimes not elevated, and with narrow groove or small fovea; anterior area along metanotum shortly and deeply depressed; outer rim of spiracle partially covered by the raised lobe of callus; callus and metapleuron reticulated as the rest of propodeum; callus with 2 setae. Legs: fore and hind coxae very weakly engraved-reticulate; fore and hind femora stout. Forewing 2.4–2.6 times as long as wide; costal cell 13–14 times as long as wide; submarginal vein with 3–4 setae; speculum closed; setae on front edge of marginal vein 0.9–1.1 times as long as stigmal vein; costal cell:marginal vein:stigmal vein=2.9–4.0:2.8–3.8:1.0; cilia of apical margin 0.10–0.16 length of the width of forewing, 0.7–0.8 length of stigmal vein.

Petiole short but distinct, without sculpture, sometimes with a lateral seta. Gaster (Fig. 11) 0.9–1.5 times as long as wide, about 1.3–2.4 times as long as thorax, distinctly to weakly engraved-reticulate; spiracle visible in dorsal view.

Male. Body length 1.2–1.4 mm. Differs from female as follows. Antenna (Figs. 13, 14): scape about 1.8 times as long as wide, with ventral plaque about 0.6 length of scape; combined length of pedicel and flagellum 0.9–1.1 times as long as head width; pedicel about 0.4 times as long as scape; each flagellar segment with a short transverse row of dark and long setae on the upper side; F1 about as long as wide, slightly shorter than pedicel; F2–F4 slightly longer than wide, slightly longer than the previous segment; clava about 3.0 times as long as wide.

Additional material examined. Japan: Hokkaidô: Bibai, 1 ♀, 4. VII. 1976 (K. Kamijo) (SEHU); Maruyama, Sapporo, 1 ♀, 18. VII. 1993 (E. Ikeda) (SEHU); Sôunkyô, 1 ♀, 6. VIII. 1960 (K. Kamijo) (SEHU); Toikanbetsu, Teshio, 1 ♂, 12. VIII. 1980 (K. Kamijo) (SEHU); Mt. Yôtei, Kutchan, 1 ♂, 15. VII. 1992 (Y. Sakamaki, et al.) (SEHU). Honshû: Yoshibezawa, Kawai, Iwate, 1050m, 1 ♀, 12–17. VIII. 1991 (A. Smetana) (CNCI). Kyûshû: Mt. Aburayama, Fukuoka, 1 ♀, 21. VI. 1959 (S. Miyamoto) (ELKU); Mt. Hiko, Fukuoka, 1 ♀, 16. IX. 1969 (K. Kanmiya) (ELKU). Thailand: Lampang, 1 ♀, 23. X. 1986 (K. Maeto) (SEHU).

Distribution. Japan (Hokkaidô, Honshû, Kyûshû) and Thailand.

Host. *Atherigona* sp. (Diptera, Muscidae) (Ferrière, 1960).

Remarks. This species is distinguished from the other species of *Aceratoneuromyia* by the characteristics mentioned in the diagnosis.

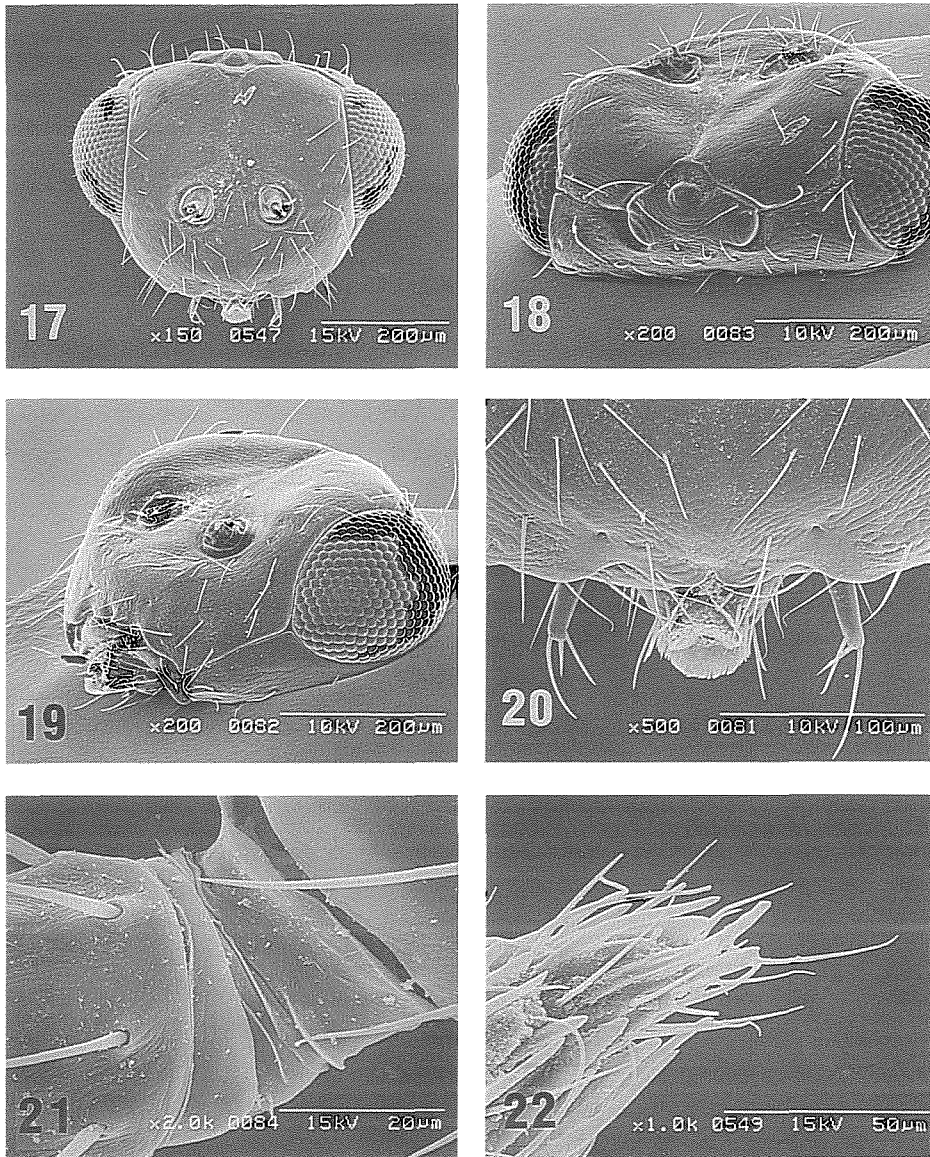
Graham (1991) states that the propodeum of this species is medially fully as long as the scutellum, and the cilia of the apical margin of the forewing nearly 0.2 length of the stigmal vein. The specimens of the type-series examined, however, have the propodeum at most 0.6 times as long as the scutellum, and the cilia 0.7–0.8 times as long as the stigmal vein.



*Aceratoneuromyia kamijoi* sp. n.  
(Figs. 15–28)

**Diagnosis**

Torus (Fig. 17) situated above the lower edge of eye. Frontofacial sutures absent. Malar sulcus (Fig. 19) distinct. Each funicular segment (Figs. 15, 16) distinctly longer than wide. Mesoscutum (Fig. 24) with 3 pairs of setae. Submedian line of scutellum (Fig. 25)



Figs. 17–22. *Aceratoneuromyia kamijoi* sp. n., ♀. — 17. Head in facial view; 18. Head in dorsal view; 19. Head in ventrolateral view; 20. Mouth; 21. Anelli. The left segment is the 1st funicular segment. The right segment is the pedicel; 22. Apex of clava.



present. Spiracle of gaster situated on the lateral side of gaster, not visible in dorsal view.

### Description

**Female.** Body length 1.4–2.1 mm. Body dark brown to black, tinged with green: face along mouth brownish; tegula and upper part of mesopleuron pale brown; gaster somewhat lighter than thorax. Scape and pedicel pale brown; flagellum darker than pedicel. Legs pale brown: coxae somewhat darker than femora; base of fore coxa blackish; tips of tarsi infusate. Wings hyaline.

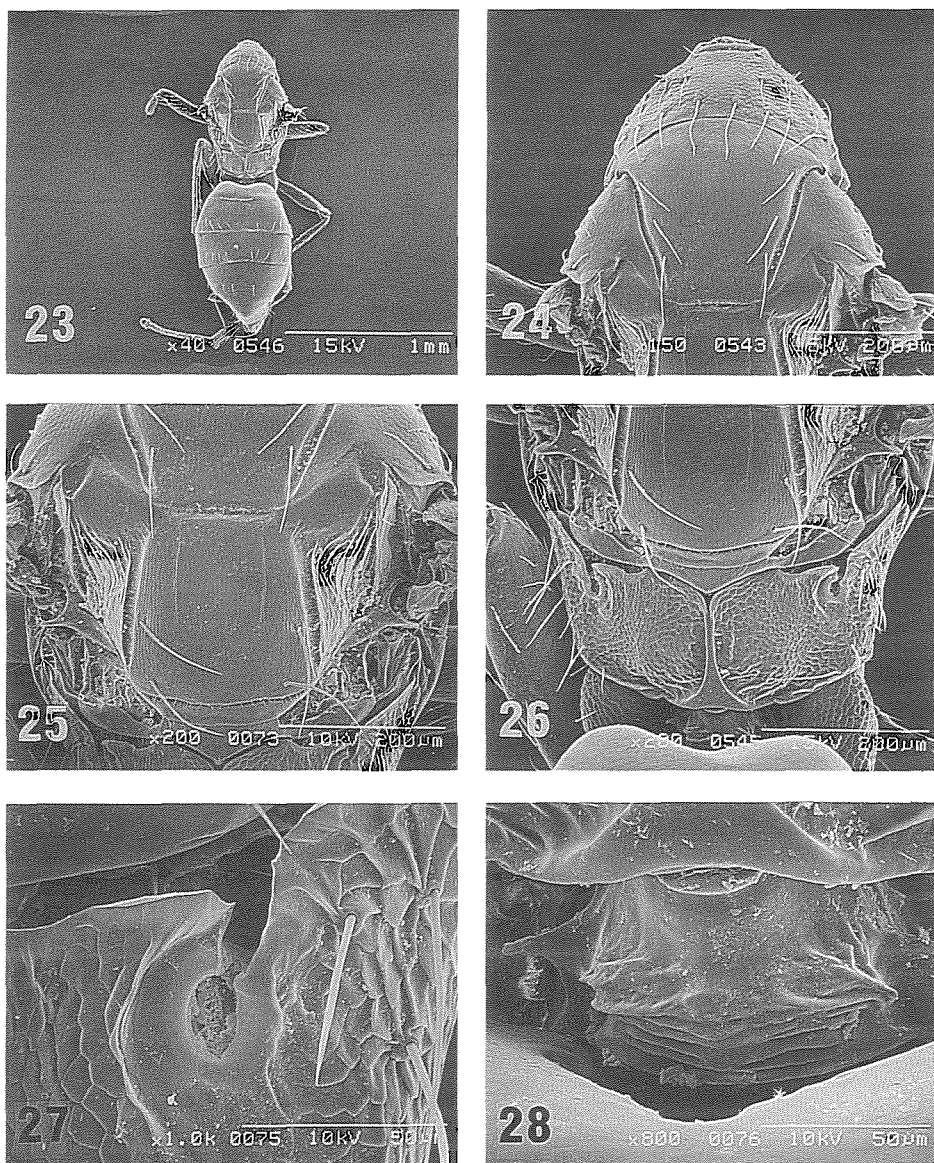
Head (Fig. 17) about 1.3 times as wide as high, about 2.4 times as wide as long, 1.0–1.1 times as wide as thorax, very weakly engraved-reticulate. Vertex (Fig. 18) with relatively long setae, with a groove between lateral ocellus and eye. POL about 2.0, OOL 1.8–2.0 times as long as median ocellus diameter. Frontofacial sutures absent. Eye 1.6–1.7 times as high as malar space length. Malar sulcus (Fig. 19) distinct, groove-like, weakly curved. Torulus situated above the lower edge of eye. Clypeus (Fig. 20) delimited laterally by dark line. Tentorial pit distinct. Mouth 1.6–1.9 times as long as malar space. Antenna (Fig. 15): scape about 3.3 times as long as wide, 1.0–1.1 times as long as eye height, reaching median ocellus; combined length of pedicel and flagellum 1.2–1.3 times as long as head width; pedicel about 0.5 times as long as scape; F1 2.0–2.4 times as long as wide, 0.9–1.1 times as long as pedicel; F2 2.2–2.3 times as long as wide, 0.8–1.0 times as long as F1; F3 1.3–1.6 times as long as wide, 0.8–0.9 times as long as F2; clava 2.6–2.8 times as long as wide, 2.3–2.4 times as long as F3.

Thorax (Fig. 23) 1.6–1.7 times as long as wide, very weakly engraved-reticulate. Pronotum (Fig. 24) 0.3–0.4 times as long as mesoscutum, distinctly engraved-reticulate medially, weakly raised-reticulate laterally. Mesoscutum with 3 pairs of adnotaular setae, without median line. Axilla strongly advanced. Scutellum (Fig. 25) 0.8–0.9 times as long as wide; submedian line weak, indistinct posteriorly; sublateral line distinct and deep; both pairs of scutellar setae longer than the width of median area between submedian lines; anterior pair situated behind the middle of scutellum, and along sublateral line, directed posteriorly; posterior pair situated in the middle between submedian and sublateral lines. Dorsellum (Fig. 26) short, angular posteriorly, very weakly engraved-reticulate, almost smooth. Propodeum 2.7–3.3 times as long as dorsellum, about 0.6 times as long as scutellum, weakly raised-reticulate, with strong median carina having anterior triangular fovea; outer rim of spiracle (Fig. 27) slightly covered by the lobe of callus; weak paraspicular carina present anteriorly; callus and metapleuron with dense raised-reticulation, which is stronger than that of the rest of propodeum; callus with 5–8 setae. Legs: fore coxa weakly engraved-reticulate; hind coxa distinctly raised-reticulate, with dorsal carina on the apical half; femora slender. Forewing 2.2–2.3 times as long as wide, densely setose, with speculum small and closed below; costal cell 10–12 times as long as wide; submarginal vein with 4–6 dorsal setae; setae on front edge of marginal vein 0.5–0.8 times as long as stigmal vein; costal cell:marginal vein:stigmal vein=2.8–3.2:3.0–4.0:1.0; cilia of apical margin 0.4–0.6 length of stigmal vein.

Petiole (Fig. 28) distinct, 0.5–0.6 times as long as propodeum, with a few weak transverse carinae, with a very weak lateral spine. Gaster 1.7–2.3 times as long as wide, 0.8–1.1 times as long as thorax. Spiracle directed laterally, not visible in dorsal view. Longest cercal seta at most about 1.7 times as long as the next longest, kinked.

**Male.** Body length 1.4–2.0 mm. Differs from female as follows. Head about 1.4 times as wide as high, about 1.2 times as wide as thorax. Eye about 2.0 times as high as

malar space length. Antenna (Fig. 16): scape dark brown, 2.6–3.1 times as long as wide, 0.9–1.0 times as long as eye height; ventral plaque about 0.6 length of scape; pedicel pale to dark brown, about 0.4 times as long as scape; flagellum pale to dark brown; F1 1.1–1.2 times as long as wide, 0.7–0.8 times as long as pedicel; F2 1.8–2.0 times as long as wide, 1.5–1.7 times as long as F1; F3 1.8–2.0 times as long as wide, about as long as F2; F4 about twice as long as wide, about as long as F3; clava 3.3–4.0 times as long as wide, about 2.0



Figs. 23–28. *Aceratoneuromyia kamijoi* sp. n., ♀. — 23. Thorax and gaster; 24. Pronotum and mesoscutum; 25. Scutellum; 26. Dorsellum and propodeum; 27. Right propodeal spiracle; 28. Petiole.

times as long as F4. Fore and hind coxae dark brown to black, raised-reticulate; mid coxa pale to dark brown; fore and hind femora rarely dark brown.

Holotype (♀). Japan: Hokkaidō: Bibai, 27. VI. 1991 (K. Kamijo). Paratypes. Japan: Hokkaidō: Aizankei, 1 ♀, 3. VIII. 1966 (K. Kamijo) (SEHU); Atsuma, 1 ♀, 11. VII. 1980 (K. Kamijo) (SEHU); Bibai, 2 ♀, 4. VII. 1977 (K. Kamijo) (SEHU) / 1 ♀, 13. VII. 1979 (K. Kamijo) (SEHU) / 1 ♀ 1 ♂, 20. VI. 1987 (K. Kamijo) (BMNH) / 5 ♀ 1 ♂, 3. VII. 1989 (M. J. Sharkey), sweep (CNCI) / 3 ♀, 27. VI. 1991 (K. Kamijo) (SEHU); Biei, 1 ♀ 1 ♂, 22. VII. 1982 (K. Kamijo) (SEHU); Nopporo, Ebetsu, 1 ♀, 27. VI. 1965 (M. Suwa) (SEHU) / 1 ♀, 13. VII. 1987 (K. Kamijo) (SEHU); Hayakita, 1 ♀, 25. VI. 1987 (K. Kamijo) (SEHU); Hobetsu, 1 ♀ 1 ♂, 25. VI. 1980 (K. Kamijo) (SEHU); Iwamizawa, 4 ♀, 3. VII. 1982 (K. Kamijo) (SEHU); Pirika, Imakane, 2 ♀, 30. VI. 1992 (Y. Sakamaki) (SEHU); Kamikawa, 500m, 2 ♀, 4. VII. 1989 (M. J. Sharkey), sweep (CNCI); Kamuishiri, Tobetu, 1 ♀, 22. VI. 1991 (K. Kamijo) (SEHU); Karifuto, 1 ♀, 20. VII. 1961 (K. Kamijo) (SEHU); Chimikeppu, Kitami, 2 ♀, 20. VII. 1977 (K. Kamijo) (SEHU); Kitamoshiri, 1 ♀, 30. VII. 1958 (K. Kamijo) (SEHU); Kutchan, 1 ♀, 17. VII. 1992 (Y. Sakamaki et al.) (SEHU); Mt. Yôtei, Kutchan, 5 ♀, 16. VII. 1992 (Y. Sakamaki et al.) (SEHU); Naganuma, 2 ♀, 29. VI. 1986 (K. Kamijo) (SEHU); Nukabira, 2 ♀ 1 ♂, 11. VII. 1961 (H. Takada) (SEHU) / 6 ♀, 5. VII. 1989 (M. J. Sharkey), sweep (CNCI); Oshima, 2 ♀, 12. VII. 1976 (K. Kamijo) (BMNH); Otoineppu, 1 ♀ 1 ♂, 25. VII. 1992 (E. Ikeda) (BMNH); Hokkaidō Univ., Sapporo, 1 ♀, 27. VI. 1992 (E. Ikeda) (SEHU); Jōzankei, Sapporo, 350m, 2 ♀, 30. VI. 1989 (M. J. Sharkey), sweep (CNCI); Nopporo, Sapporo, 2 ♀, 14. VI. 1980 (K. Maeto) (NIAES); Mt. Soranumadake, Sapporo, 1 ♀, 25. VII. 1982 (M. Miyazaki) (NIAES); Teine, Sapporo, 2 ♀, 26. VI. 1958 (K. Kamijo) (SEHU); Sapporo, 1 ♀, 3. VII. 1965 (H. Takada) (SEHU) / 1 ♀, 16. VI. 1967 (K. Kushigemachi) (SEHU); Sōunkyō, 1 ♀, 6. VII. 1960 (K. Kamijo) (SEHU); Yamabe, 1 ♂, 30. VI. 1960 (K. Kamijo) (SEHU) / 2 ♀, 5. VII. 1961 (K. Kamijo) (SEHU). Honshū: Mt. Chausu, Toyone, Aichi, 1300m, 3 ♀, 16. VII. 1992 (K. Yamagishi), sweep (SEHU); Shitara, Uradani, Aichi, 1 ♀, 4–10. VII. 1994 (K. Yamagishi) (SEHU); NIAES, Tsukuba, Ibaraki, 2 ♀, 15–25. VII. 1989 (M. J. Sharkey), pan trap (CNCI); Matsukusa, Iwate, 600m, 1 ♀, 21. VI. 1989 (M. J. Sharkey), sweep (CNCI); Mts. Adatara, Yokomuki, Fukushima, 1 ♀, 9–10. VII. 1985 (K. Konishi) (NIAES); Katashina-mura, Gunma, 1 ♂, 11. VII. 1988 (H. Makino) (SEHU); Mt. Hyōnosen, Sekinomiya, Hyogo, 1 ♀ 1 ♂, 1. VI. 1983 (K. Konishi) (NIAES); Nagano, 1 ♀ 1 ♂, 8. VI. 1959 (K. Kamijo) (SEHU); Amagi, Izu, Shizuoka, 1 ♂, 31. V. 1959 (K. Kamijo) (SEHU). Kyūshū: Mt. Hikosan, Fukuoka, 1 ♀, 14. VI. 1959 (K. Yasumatsu) (ELKU) / 1 ♀, 7. VI. 1965 (H. Takada) (SEHU) / 2 ♀, 23. VI. 1968 (K. Kanmiya) (ELKU) / 1 ♀, 20. VI. 1969 (K. Kanmiya) (ELKU); Kamiozoegawa, Fuji, Saga, 1 ♀, 19. V. 1973 (K. Yamagishi) (ELKU). Korea: Mt. Sudosan, Kyongsangpuk-do, 1000m, 1 ♂, 13–14. VII. 1971 (K. Yamagishi) (ELMJ).

Distribution. Japan (Hokkaidō, Honshū, Kyūshū) and Korea.

Host. Unknown.

Remarks. *Aceratoneuromyia kamijoi* sp. n. is easily distinguished from the other species of *Aceratoneuromyia* by the characteristics mentioned in the diagnosis.

This species disagrees in some characters with the diagnoses of *Aceratoneuromyia* previously given by Bouček (1988), Graham (1991), and LaSalle (1994), e.g., each funicular segment of the female distinctly longer than wide, the frontofacial sutures absent, the malar sulcus distinct, the mid lobe of the mesoscutum with 3 pairs of adnotaular setae, the spiracle of the gaster not visible in dorsal view, one cercal seta distinctly longer than the others. In other characters, however, this species agrees well with the diagnoses of *Aceratoneuromyia* given by the authors, and it may be reasonable to place the species in this genus. In order to include this unusual new species in *Aceratoneuromyia*, a diagnosis of this genus will be given as follows: apical seta of the terminal spine of clava long, about twice as long as the

spine (Figs. 6, 22); each funicular segment of female usually transverse to quadrate (Figs. 4, 13), rarely distinctly longer than wide (Figs. 15, 16); antenna with long and scattered setae; vertex with relatively long setae (Figs. 2, 17); frontofacial sutures usually present (Fig. 1), rarely absent (Fig. 17); malar sulcus usually weak, rarely distinct (Fig. 19); clypeus bilobed (Figs. 3, 20); thorax flattened, very weakly engraved-reticulate, almost smooth; pronotum and propodeum relatively long (Figs. 8, 10, 24, 26); mid lobe of mesoscutum with 2–3 pairs of adnotaular setae; submedian line of scutellum weak or absent (Figs. 9, 25); sublateral line distinct; anterior pair of scutellar setae situated behind the middle of scutellum; tip of hypopygium situated close to the apex of gaster; spiracle of gaster directed dorsally and visible in dorsal view (Fig. 12), rarely directed laterally and not visible in dorsal view.

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